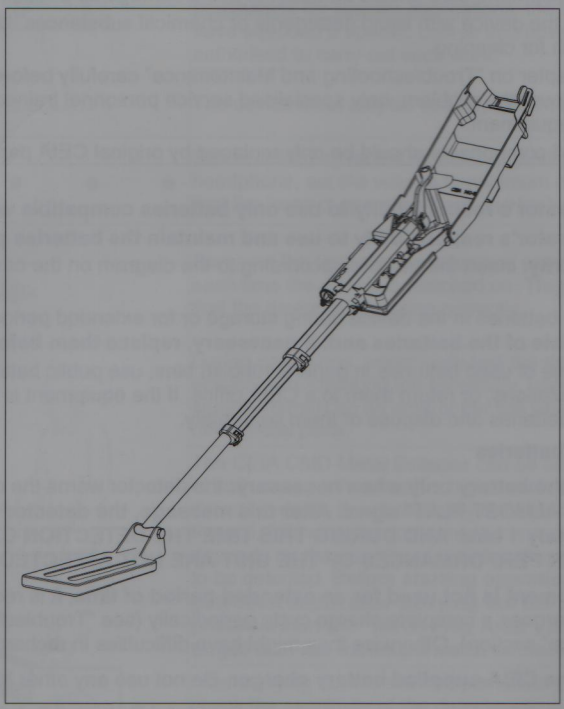
US

CEIA CMD

COMPACT METAL DETECTOR

Operator manual



CEIA CMD

Compact Metal Detector

Operator manual

ATTENTION!

Read this manual carefully before installing, operating or carrying out maintenance on the device.
Keep this booklet in a safe place for future reference.

Rev.: FI 041 GB 140K5 v2_310	Version: HW: 1.xx, SW 1.xx	Date: 2010-02-17

INSTRUCTIONS

ATTENTION! READ THESE INSTRUCTIONS BEFORE WORKING WITH THE DEVICE.

- Follow the instructions contained in this manual for all operations relating to installation, use and maintenance of the device. CEIA cannot be held responsible for any damage resulting from procedures which are not expressly indicated in this manual.
- Using the detector other than specified may result in non-detection of the search target. CEIA will not be held responsible for any damage resulting from improper use of its equipment.
- As with all equipment, care should be taken to avoid damage as a result of non-intended use.
- Do not wash the device with liquid detergents or chemical substances. Use a slightly moist, non-abrasive cloth for cleaning.
- Read the chapter on "Troubleshooting and Maintenance" carefully before calling the service centre. Whatever the problem, only specialised service personnel trained by CEIA should service this equipment.
- Any damaged components should be only replaced by original CEIA parts.

BATTERIES

- **It is the operator's responsibility to use only batteries compatible with the unit.**
- **It is the operator's responsibility to use and maintain the batteries properly.**
- **Battery polarity**: insert the batteries according to the diagram on the case, close to the battery compartment.
- Do not leave batteries in the device during storage or for extended periods of time. **Check the expiration date of the batteries and, if necessary, replace them before operation**.
- Do not dispose of used batteries in general rubbish bins; use public battery collection facilities as per local regulations, or return them to a CEIA office. If the equipment is to be disposed of, remove the batteries and dispose of them separately.

Rechargeable batteries

- **Recharge the battery only when necessary:** the detector warns the operator by means of a "BATTERY ALMOST FLAT" signal**. After this message, the detector can be used for approximately 1 hour AND DURING THIS TIME THE DETECTION CAPABILITY AND ALL THE OTHER PERFORMANCES OF THE UNIT ARE NOT AFFECTED.**
- **If the equipment is not used for an extended period of time**, it is recommended that the battery undergoes a complete charge cycle periodically (see "Troubleshooting and Maintenance" section). Otherwise they might have difficulties in recharging.
- **Use only the CEIA-supplied battery charger**. Do not use any other kind of battery charger.
- **Use only the CEIA batteries supplied with the Metal Detector Set or as spare parts**. Do not try to charge any other kind of batteries with **the CEIA-supplied battery charger**.
- **Do not try to charge non-rechargeable batteries. DANGER OF EXPLOSION!**
- **Use of non-rechargeable batteries**. If rechargeable batteries are not available, the unit can be powered by 2 C-size 1.5V alkaline batteries. **The operational and functional characteristics are not affected.**

WARRANTY CONDITIONS

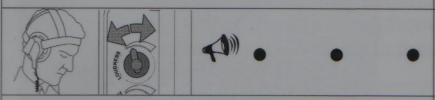
The warranty on all CEIA products, extended to the period agreed with the Sales Department, is applicable to goods supplied from our factory, and for every constituent part thereof, with the exception of the batteries. Any form of tampering with the device, and in particular opening its container, is strictly forbidden and will invalidate the warranty. The warranty lapses if the Metal Detector is not used in accordance with the instructions contained in this manual. In particular, the Metal Detector must be transported in the special case supplied with the equipment, and its various parts arranged therein as described in this manual. Transport of the Metal Detector without its case supplied with the device is only allowed when it is being carried by hand.

NOTES ON SAFETY DURING USE

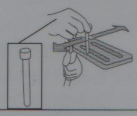
Correct Operation

The CEIA CMD Metal Detector is a detector which can be used to localize small or large metal masses. This manual describes the ways of employing the detector, but does not contain detailed information on general precautions for specific applications: the operator must have attended a specific course and have been authorised to carry out such work.

The device must only be used by qualified personnel.



Before switching on the detector or putting on the headphone, set the volume to minimum and adjust it so that the 'correct operation' tone can be heard clearly.

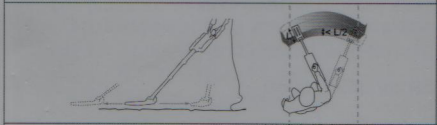


Carry out the test with the reference sample provided each time the device is switched on. This is to check that the device is operating correctly.

During operations, periodically test the detector's efficiency by checking the sensitivity, using the specific sample (target) on an area of the soil which is free of other metal parts.

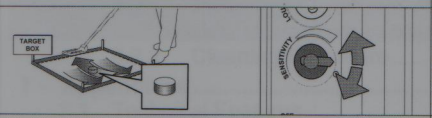
The CEIA CMD Metal Detector can be used on all types of soil, even on those with a high metal content, The detection depth is automatically optimised according to the soil, following the compensation procedure, and also depends on the quantity of metal contained in the target to be detected. **Before starting operation, check the detection depth after carrying out the compensation procedure on the "Metal Free Area", using the target with the minimum metal content.**

After carrying out the soil compensation procedure, check the sensitivity of the detector using the specific sample (target), to be detected at the desired detection distance.

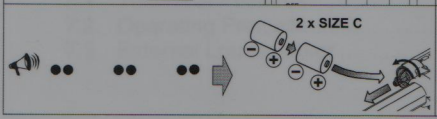


When moving over the soil, keep the height as constant as possible.

Move forward not more than half the length of the sensitive part of the search head.



Pay attention to the position of the sensitivity potentiometer, since this modifies the detection depth of the detector. Keep the sensitivity at the level necessary to detect the specific sample (target).



Replace the batteries as soon as possible if the low battery signal (double beep) is heard.

Battery polarity: insert the batteries according to the diagram on the bottom of the case.

NOTES ON SAFETY DURING USE (continued)

INCORRECT Operation!	
 NO!	DO NOT OPERATE IF THERE IS NO 'CORRECT OPERATION' TONE.
 NO!	DO NOT OPERATE IF THE **FAULT** ALARM TONE IS HEARD. The only exception to this rule is when the self-diagnosis signal is due to a resetting operation carried out above a large metal mass: in this case, however, the self-diagnosis signal tone disappears when the device is reset again with the head far away from the metal.

Customer Satisfaction Report

Your suggestions and comments on the products and services offered by CEIA and its distribution network are extremely important for improving our procedures. We would ask you to send them to us by compiling and returning the form available:

http://www.ceia.net/groundsearch/satisfaction

Thank you for your kind interest and co-operation.

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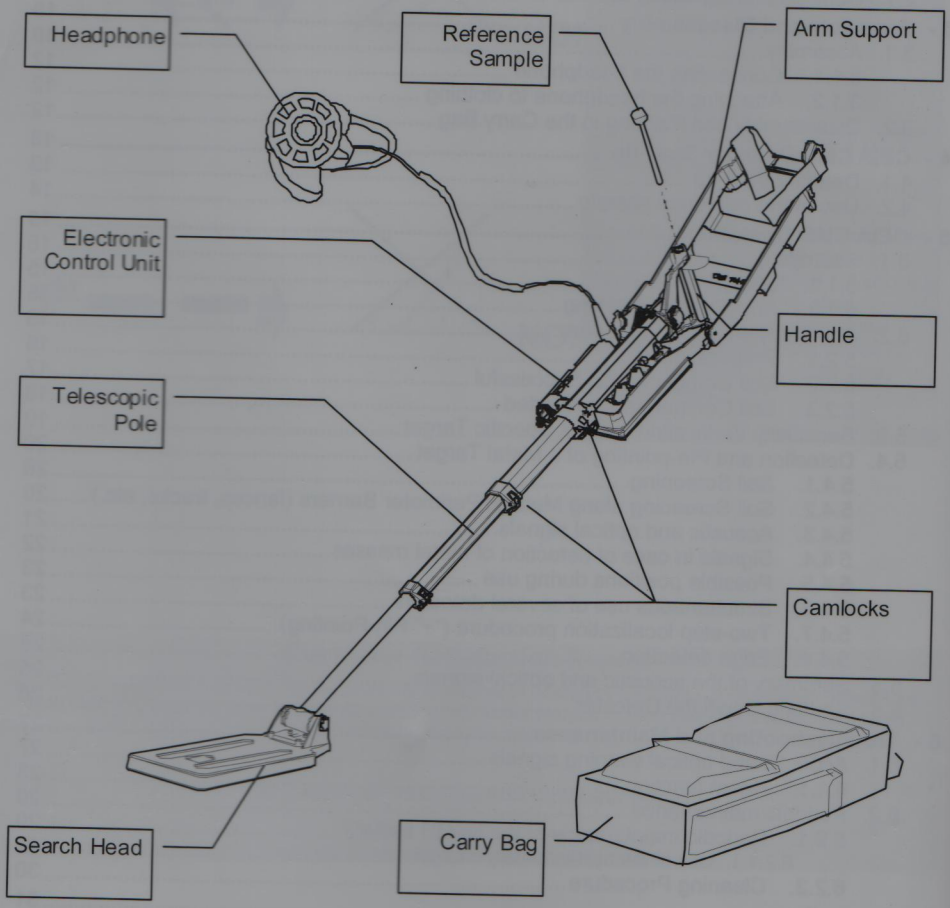
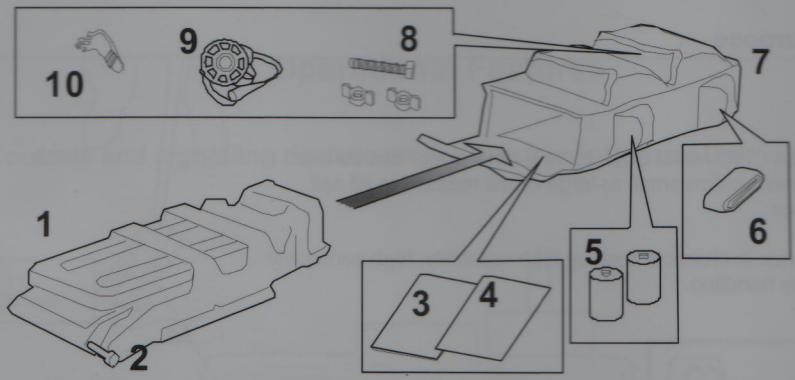
1 - Overview

1.1. Equipment Description

The **CEIA CMD - Compact Metal Detector** is a device that can be used to detect small or large metal masses in all soil conditions.

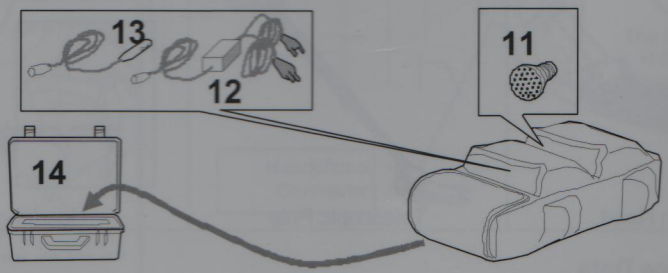


CEIA CMD Metal Detector



CEIA CMD Metal Detector in its Carry Bag

#	Description		Code	Quantity
1	CMD Metal Detector		43662	1
2	Reference sample		43860	1
3	Operating manual		43673	1
4	Field instructions and Parts List		43674	1
5	Batteries: ANSI C or IEC size LR14	1.2V Ni-MH	43664	2
		1.5V alkaline	43663	
6	Leg strap for the carry bag		43682	1
7	Carry bag		43665	1
8	Plastic locking bolt for search head (spare)		43666	1
9	Monaural headphone with connecting cable		GSMD-HP	1
10	Hook/clip for headphone		24407	1



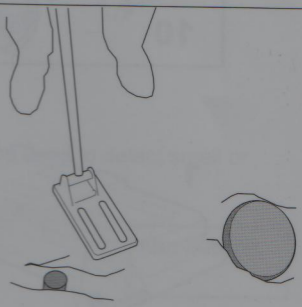
OPTIONS

#	Description	Code	Quantity
11	External loudspeaker	GSMD-EXTSPK	1
12	Power Supply Adapter for the built-in battery charger, with power cords (UL and CEE plug)	GSMD-ACPSA1	1
13	Power Supply Cable for the built-in battery charger fitted with a car cigarette lighter plug	GSMD-DCPSA1	1
14	Hard Transport Case	CMD-RTC	1

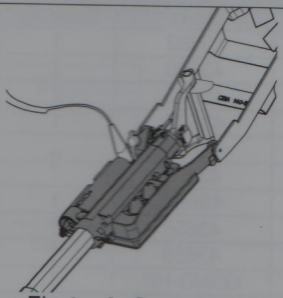
1.2. Purpose

The CEIA CMD Metal Detector is a device that can be used to detect and localize small or large metal masses in all soil conditions.

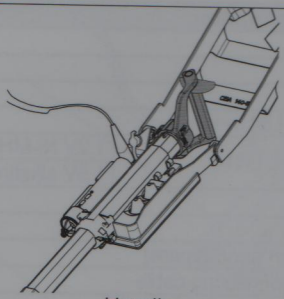
This device is characterized by high reliability, high sensitivity and easy handling.



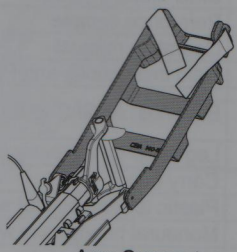
1.3. Major Hardware Components



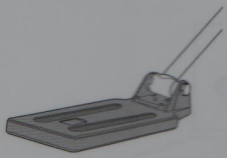
Electronic Control Unit



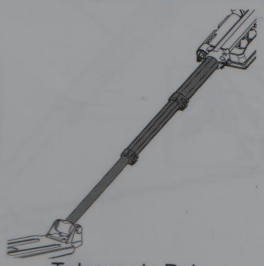
Handle



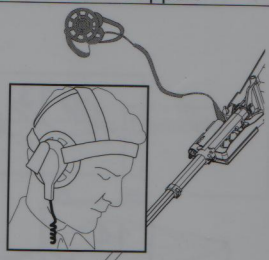
Arm Support



Search Head

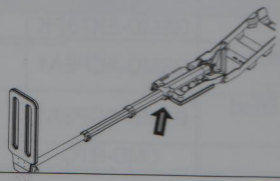


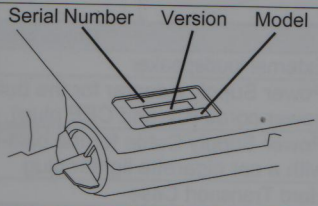
Telescopic Pole



Headphone

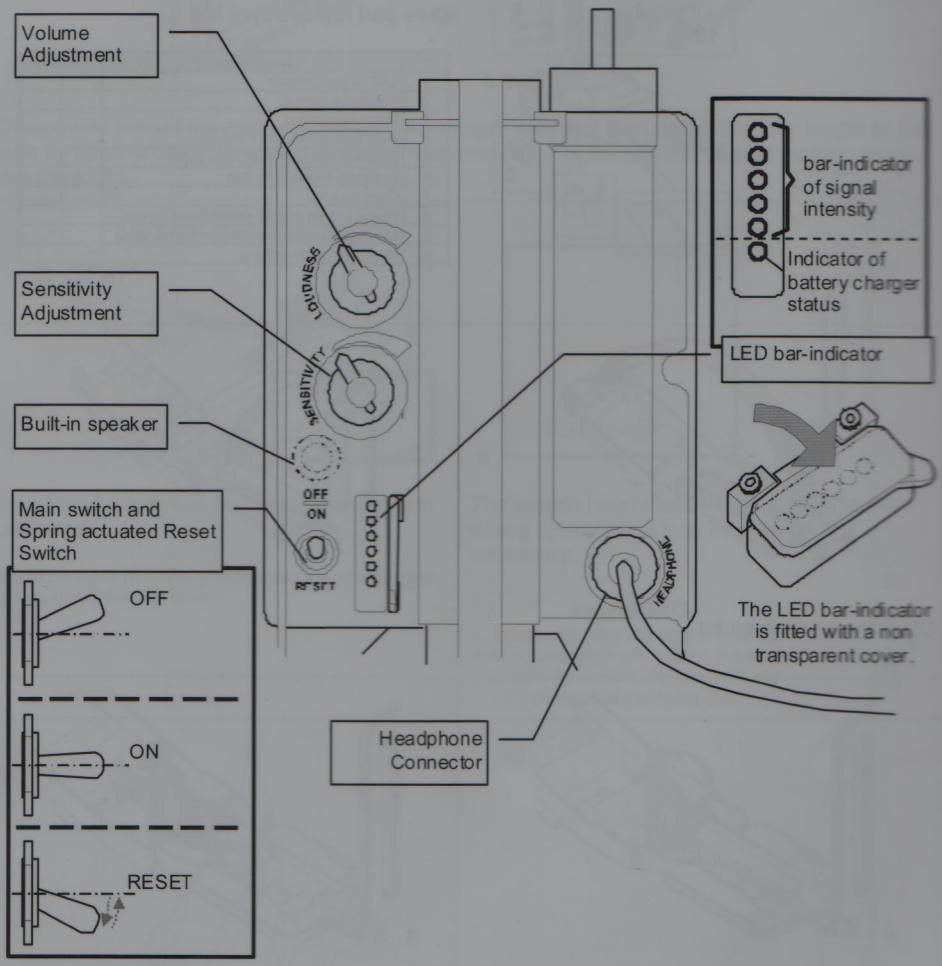
1.4. Reference Data





2 - Operational Features

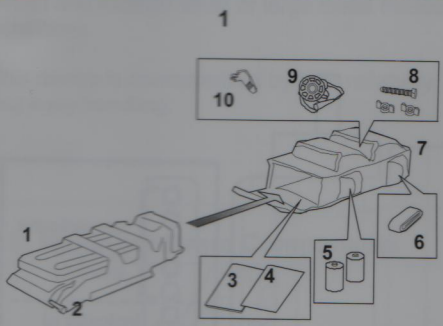
2.1. Controls and signalling devices on the Electronic Control Unit



NOTE
The built-in speaker of the control unit is automatically disabled when the headphone is connected.

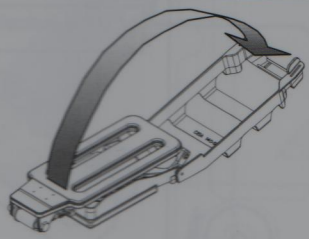
3 - Assembly and Disassembly

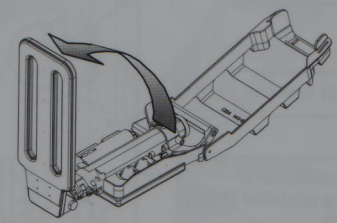
3.1. Assembly



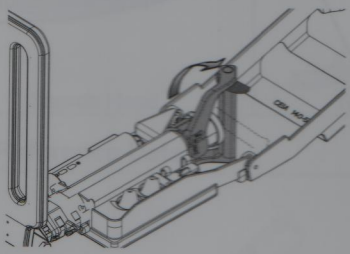
Check that all the pieces are present (Include spare part replacement kit)

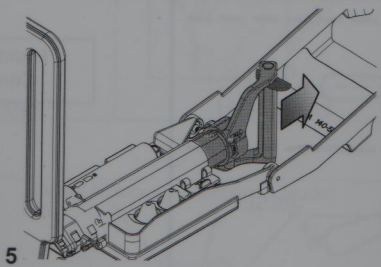
#	Description	Quantity
1	CMD Metal Detector	1
2	Reference sample	1
3	Operating manual	1
4	Field instructions and Parts list	1
5	Batteries: ANSI C or IEC size LR14	2
6	Leg strap for the carry bag	1
7	Carry bag	1
8	Plastic locking bolt for search head (spare)	1
9	Monaural headphone with connecting cable	1
10	Hook/clip for headphone	1



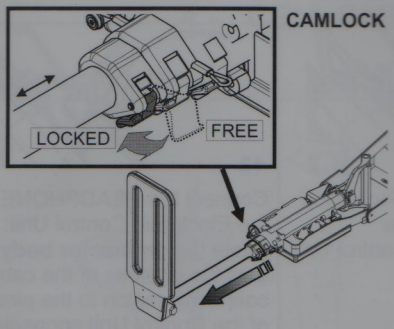


Open the metal detector.

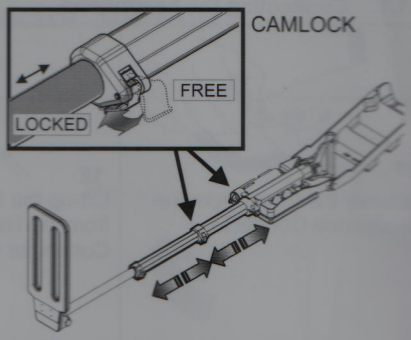




Extract the handle.

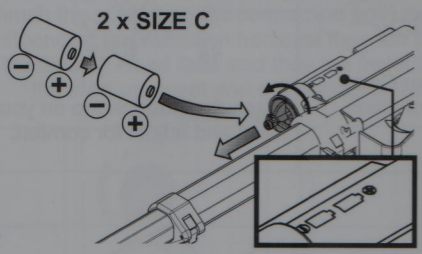


5



6

Completely extend the end section of the telescopic pole and then adjust the total length of the pole by appropriate extension of the other two sections. Fix the position of each section using the camlocks.



7

Insert the batteries according to the diagram on the case.

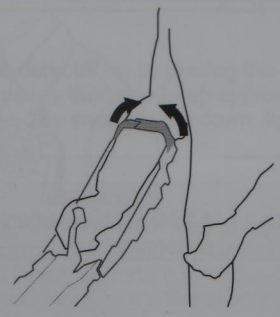
NOTE: in case of rechargeable batteries charge them before using the first time.

8

The search head must be parallel to the soil during operation: adjust its position if necessary.

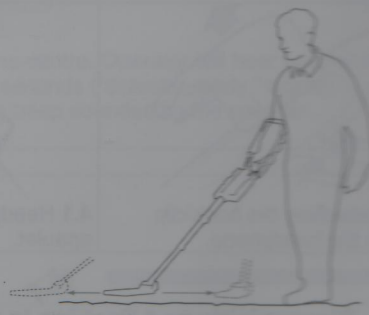
WARNING!

When adjusting the plastic locking screw, carefully hand tighten the screw and the fly-nut in order to avoid any damage to the fixing fins.



9

Tighten the strap on the arm

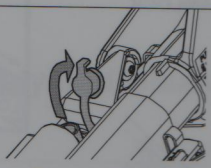


10

Ready to start up.

3.1.1. Connecting the headphone

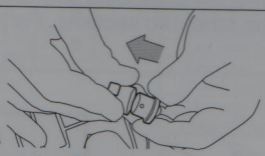
11
Remove the Cover from the Headphone Connector.



12
Lift-up the Rubber Protection from the Headphone Connector on the Control Unit

13
Connect the HEADPHONE to the Electronic Control Unit: rotate the **connector body** until the grooves of the cable connector match to the pins of the Control Unit connector and push down the cable connector (without forcing it!).

14
Secure the connector by rotating the **locking ring** until a click is heard.



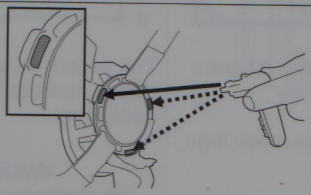
14
Insert the Connector Cover into the Rubber Protection.

15
Place the Headphone on your head and adjust for comfort.

3.1.2. Attaching the headphone to clothing

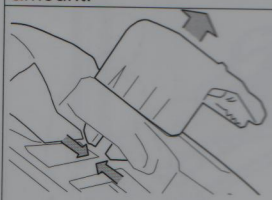
If the operator does not wish to wear the headphone on the head, it can be attached to clothing using a special hook/clip.

N.B.: in this case the audible signal volume must be increased by the necessary amount.



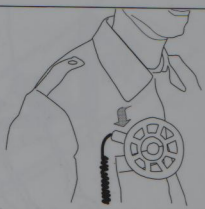
1. Attach the hook/clip to the headphone using one of the available slots.

2. Detail of the clip insertion.



3. Detaching the hook/clip from the headphone.

4.1 Headphone attached to epaulet.



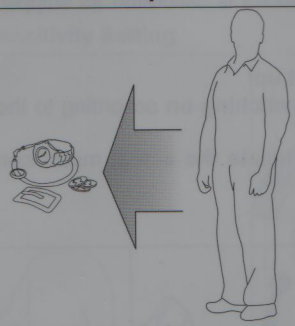
4.2 Headphone attached to uniform pocket.

3.2. Disassembly and Packing in the Carry Bag

Use the reverse assembly procedure.

4 - CEIA CMD Detector Start-up

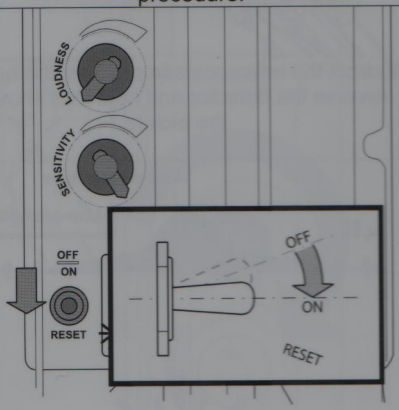
4.1. Detector start-up

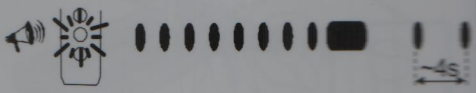


Remove all metal objects from operator body and clothes. Metallic components of the search head (such the screws on the connection box) are not influencing the detection because they are part of the Search Head itself and they are included in the start-up, reset and soil compensation procedure.

Lift the detector search head in the air **approximately 1 meter from the ground**.

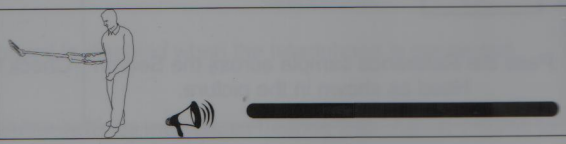
Ensure the detector search head is held away from any metal objects.





Turn the detector on by placing the Main Switch in the centre. Operator will hear several rapid beeps then one beep approximately every 4 seconds ("detector ready " signal).
The second LED down lights up with each beep sounded by the speaker.

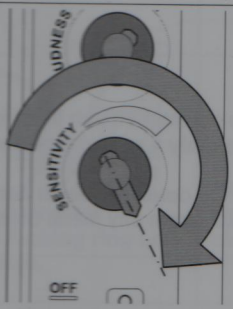
WARNING!
If a continuous tone is heard after performing start-up and raising the Search Head, perform a reset (see section "Troubleshooting and Maintenance").



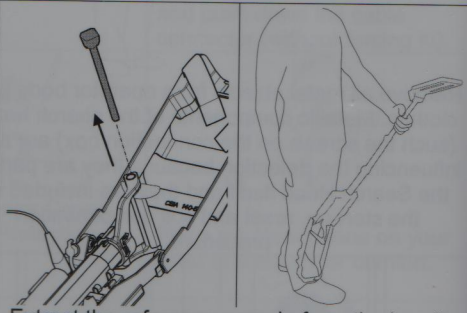
4.2. Use of the reference sample

The reference sample is intended to verify that the detector is calibrated as shipped from the factory, according to the following procedure.

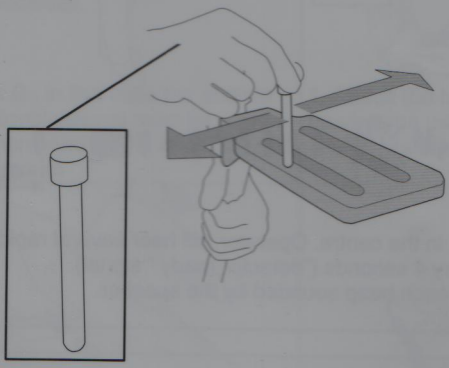
- **This procedure should only be performed at start up!**
- **The reference sample must be used only after switching on** according to the following procedure.
- **The reference sample does not represent or simulate the actual metal content of a target!**



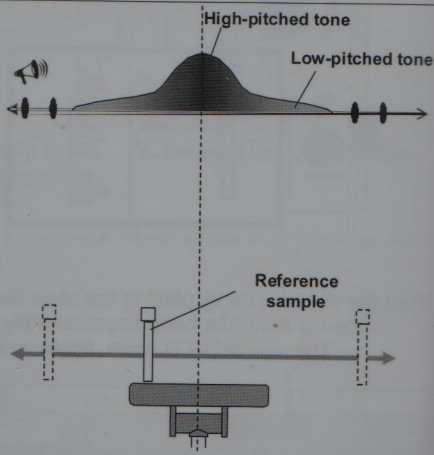
Rotate the Sensitivity Knob to the maximum.



Extract the reference sample from the handle, reverse the detector and hold it as shown in the picture.



Pass the Reference sample across the Search Head as shown in the picture.

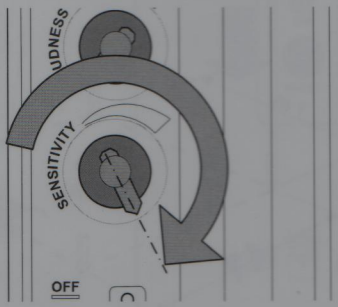


Check the presence of the alarm: high-pitched beep tone.

5 - CEIA CMD Operation

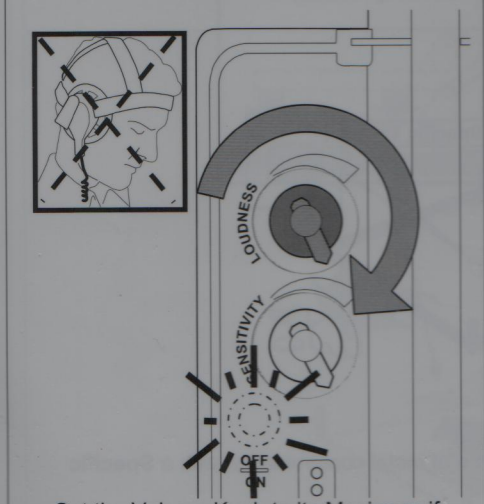
5.1. Settings

5.1.1. Sensitivity Setting

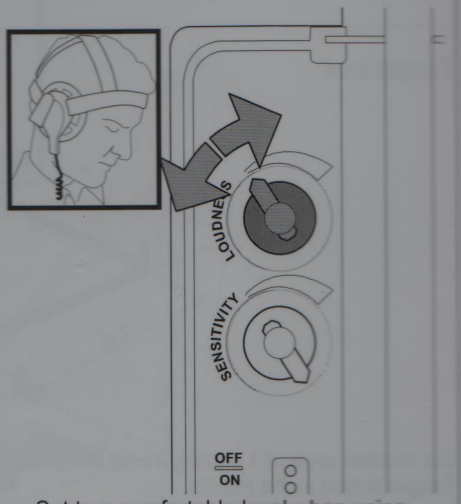


Set the Sensitivity Knob to the MAXIMUM

5.1.2. Audio Volume Setting



Set the Volume Knob to its Maximum if operating without headphone.



Set to a comfortable level when using headphone.

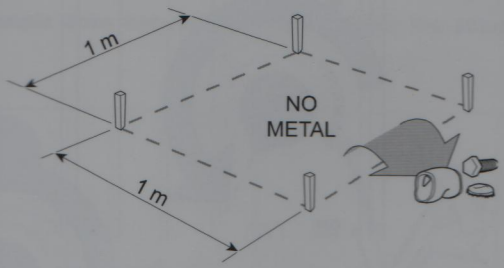
NOTE The built-in speaker of the control unit is disabled when the headphone is connected.

WARNING!
Continuous operation with excessive volume settings may cause hearing loss. Adjust volume to a comfortable level if necessary.

5.2. Soil Compensation Procedure

5.2.1. Preparation

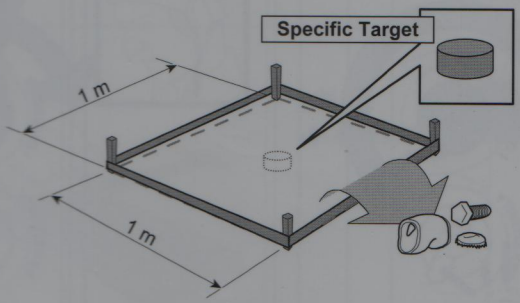
Clear box



Set an area of 1 square metre completely free of metal contamination.

This area is needed to perform the soil compensation procedure.

Target box



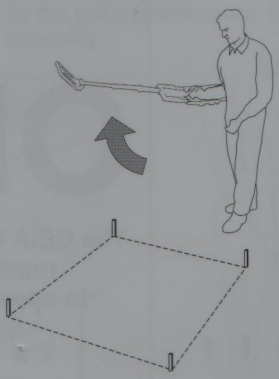
Set another area of 1 square metre completely free of metal contamination with a **Specific Target** buried in the middle.
This area is needed to check the detection capability.

It is recommended that:

- the target be equivalent to the mass of the hardest to detect object known to be in the operation area.
- the target be buried at a depth representative of the maximum expected operational depth of the actual object to detect.

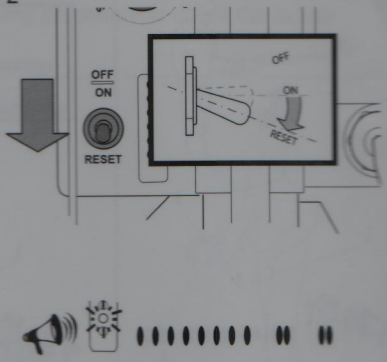
5.2.2. Soil Compensation Successful

STEP 1



Lift up the detector above the Metal Free area.

STEP 2



Hold down the Main Switch on Reset until the high frequency intermittent tone changes to a double beep.

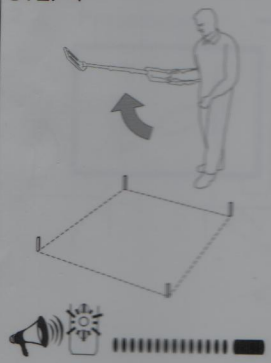
STEP 3

At the double beep, return the search head to the ground and sweep the search head from left to right in the clear box, keeping it as close as possible to the ground without touching it. During this phase the detector acquires the soil characteristics.

For the best result **the search head should be swept lower than the normal operational distance.**

Positive result

STEP 4



If the double beep changes to a high frequency intermittent tone, the soil compensation has been performed successfully.
Lift up the detector ...

STEP 5

...until the "detector ready" signal returns (a single beep every 4 seconds). Lower the search head and verify that no alarms are triggered while sweeping the soil at the normal operational distance.
In presence of alarms, lower a little the sensitivity and try again, until the Clear Box does not generate any nuisance alarm.

OK

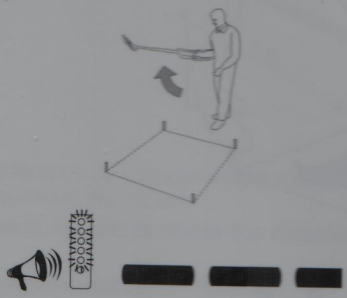
The CEIA CMD is ready to operate!

NOTE. In the event the operator receives a persistent acoustic signal from the soil, repeat the soil compensation procedure.

5.2.3. Soil Compensation Aborted

Negative result

Step 4



If at step 4 the double beep changes to a low frequency intermittent tone, the Soil Compensation has not been performed successfully.
Lift up the detector to complete the procedure.

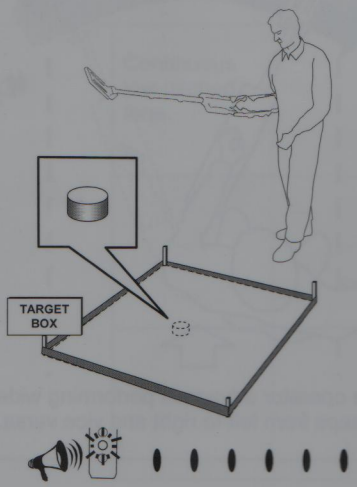
NO

Re-validate the absence of metals in the Clear Box and perform the soil compensation procedure again.

NOTE: if the procedure fails the detector resets to the default settings.

5.3. Sensitivity Verification using a Specific Target

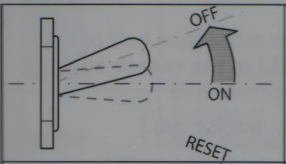
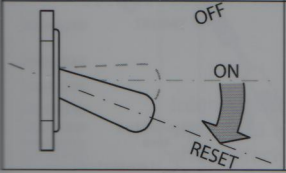
The soil compensation procedure sets all detection parameters to the optimal operative value permitted by the soil characteristics. Perform the following procedure to check the actual detection capability.



Switch to the Target Box.

Verify that the Specific Target is detected before starting the search operations.

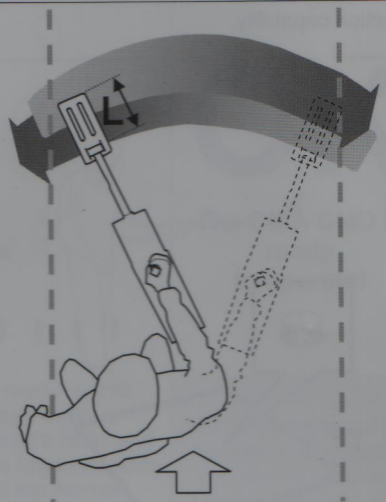
REMARKS

	**If operations are suspended and the detector is switched off, the ground compensation procedure must be repeated.** When the detector is switched on again it resets to the default settings.
	A reset does not affect already established soil compensation parameters.

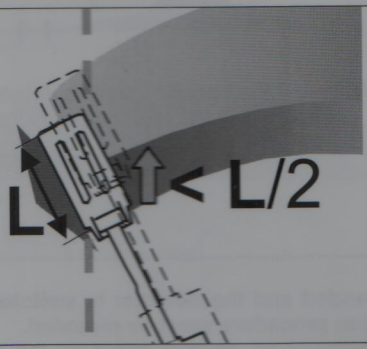
5.4. Detection and Pin-pointing of a Metal Target

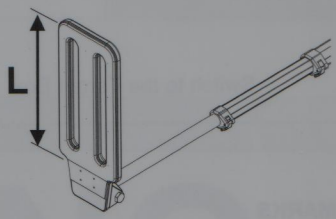
5.4.1. Soil Screening

Hold the Search Head parallel and close to the ground.



The operator advances performing wide sweeps from left to right and vice versa.



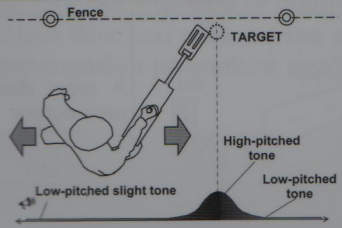


Do not advance more than half of the useful length (L) of the search head!

5.4.2. Soil Screening along Metallic Perimeter Barriers (fences, tracks, etc.)

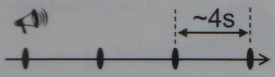
In this case the operator must proceed parallel to the fence or track, keeping the search head inclined, so as a slight tone is emitted (a bit above the alarm threshold).

Passing over a sufficiently large metal mass will cause a change in the tone of the acoustic signal.



Inspection of the soil along a fence

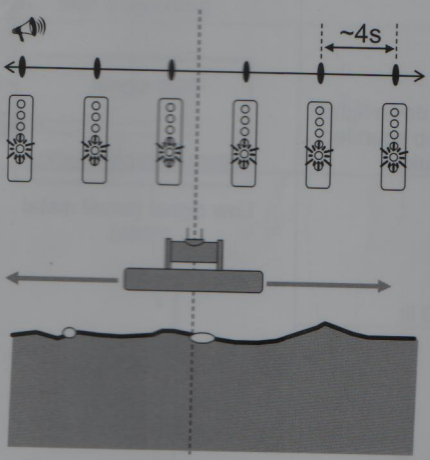
5.4.3. Acoustic and optical signals

<table>
<tr><th colspan="2">Acoustic indication</th><th>LED indication</th><th>Signal intensity</th></tr>
<tr><td colspan="2"> 

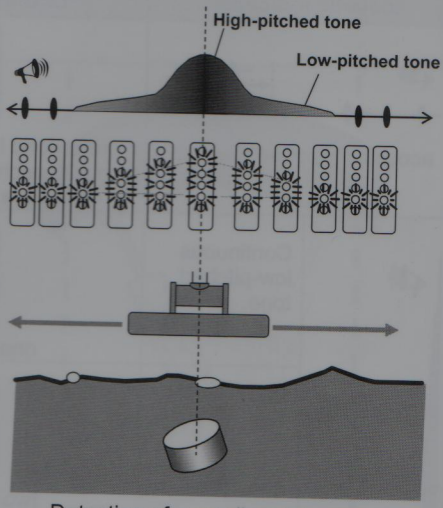
acoustic impulses (beeps)</td><td> 
The second LED down lights up with each beep sounded by the speaker.</td><td>Null signal.</td></tr>
<tr><td rowspan="6">  </td><td>Continuous low-pitched tone.</td><td> 
one LED lit</td><td rowspan="6">Low signal (small metal mass).
 
High signal (large metal mass)</td></tr>
<tr><td></td><td> 
two LEDs lit</td></tr>
<tr><td></td><td> 
three LEDs lit</td></tr>
<tr><td></td><td> 
four LEDs lit</td></tr>
<tr><td>Continuous high-pitched tone</td><td> 
five LEDs lit</td></tr>
<tr><td>Intermittent signals at long intervals

Intermittent signals at short intervals</td><td> 
five LEDs flashing
(the same interval heard through the speaker)</td></tr>
</table>

5.4.4. Signals in case of detection of metal masses

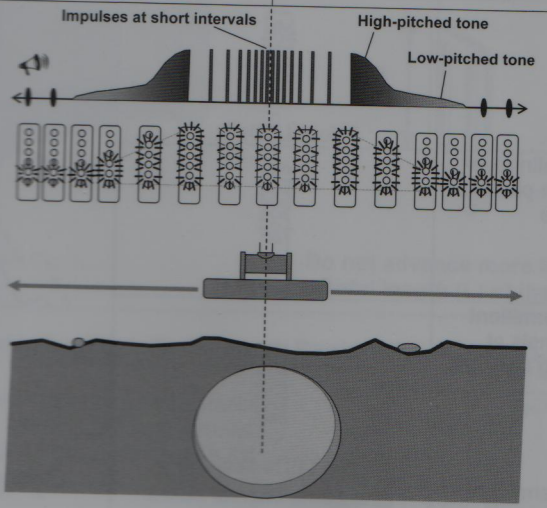


With no targets in the ground only the operating beep is heard (1 every 4 seconds). The second LED down lights up with each beep sounded by the speaker

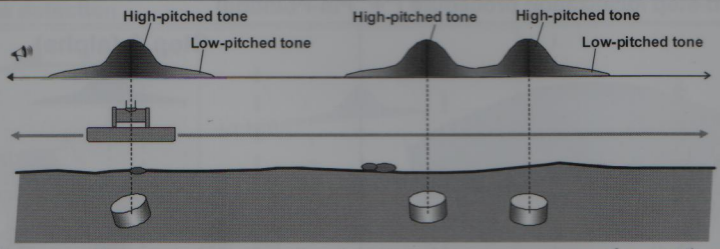


Detection of a small metal mass.
The centre of the target corresponds to the highest-pitched tone of the speaker.

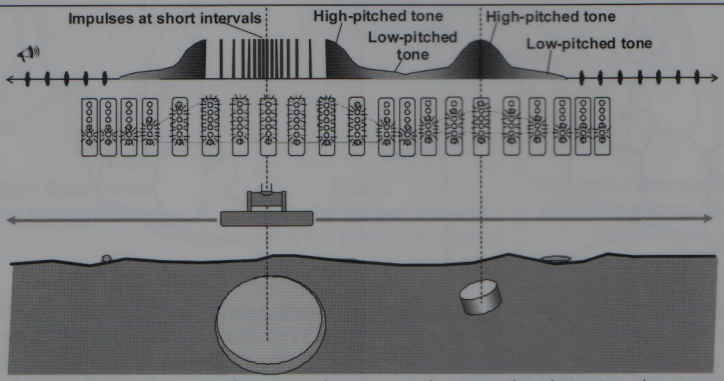
Detection does not require constant movement of the search head.



Detection of a large metal mass: the detection area is wider and the acoustic signal consists of impulses at intervals decreasing with the size of the mass.



Detection of multiple metal masses: the detector gives a sequence of acoustic signals.



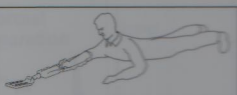
Detection of a small metal mass close to a large metal mass: the detector gives a sequence of acoustic signals with different pitch and duration.

5.4.5. Possible positions during use

CEIA CMD is capable of being used by an operator while standing, kneeling or in the prone position.

Standing operator

Kneeling operator

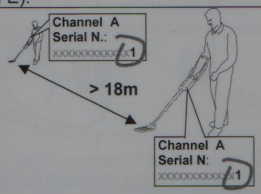


Prone position

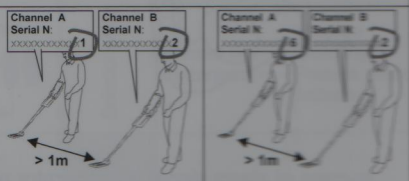
5.4.6. Simultaneous use of several detectors

The **minimum operational distance is of 1m** when a different channel is selected for each unit, **18 m** when the same channel is selected for each unit. The channels are selected in factory, according to the table below (five possible values: A, B, C, D and E).

Last figure of the serial number	Channel
1	A
2	B
3	C
4	D
5	E
6	A
7	B
8	C
9	D
0	E

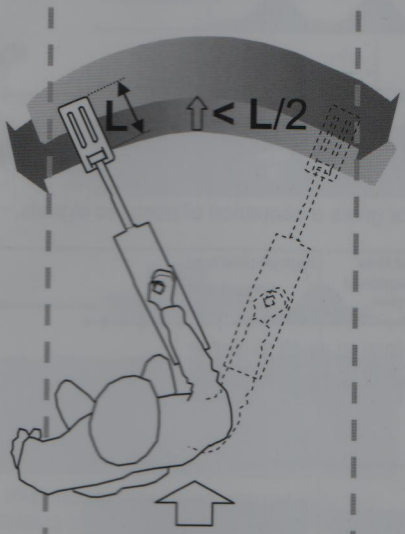


Example 1: Two units with the same channel (A): minimum operational distance of **18 m** .



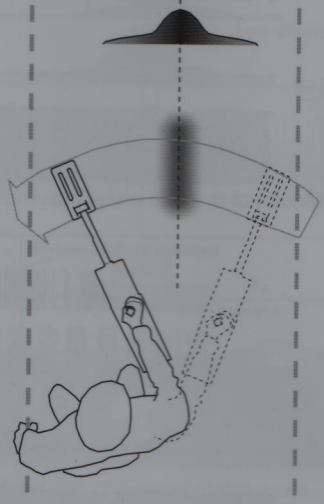
Example 2: Two units with different channels (A and B, serial number 1-2 and 6-2): minimum operational distance of **1 m**.

5.4.7. Two-step localization procedure ("+" Pin-Pointing)



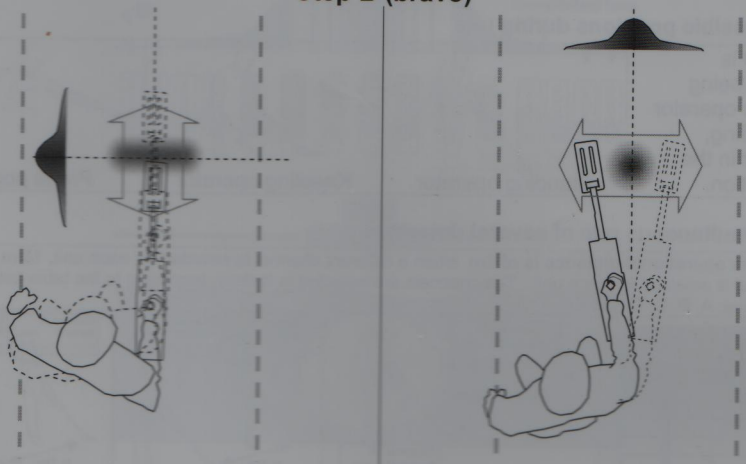
The operator advances performing wide sweeps from left to right and vice versa. **Do not advance more than half of the search head useful length!**

Step A (alpha)



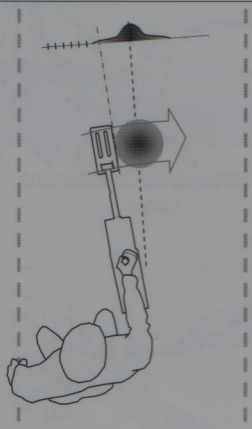
When the pin-pointing system detects a target, the tone change indicates the centreline of an area where it is probably located.

Step B (bravo)

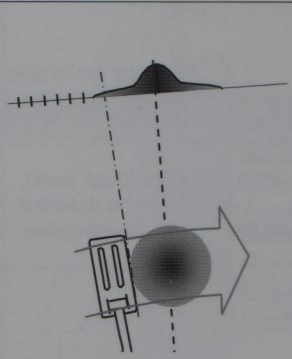


In case of alarm signal, the operator performs a more precise localization, sweeping with crossed axis (horizontal and vertical) in order to determine the central point of the target.

5.4.4. Edge detection

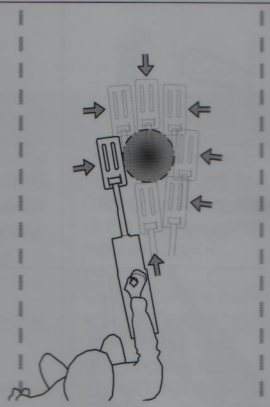


The procedure determines the zone that requires deep inspection.



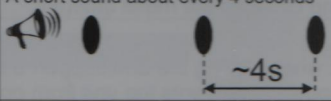
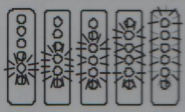
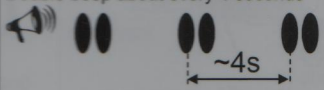
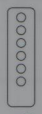
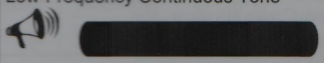
RULE
The metal target zone is marked by the lines where the acoustic signal starts.

REMARK: sweep slowly!

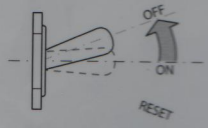


The path corresponding to the acoustic signals delimits the metal target zone.

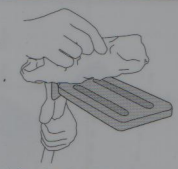
5.5. Summary of the acoustic and optical signals

LED bar-indicator	Acoustic Signal	Status	Cause	Action
 flashing	Single Beep A short sound about every 4 seconds 	Detector ready	**Normal Operation**	None
 continuous/flashing bar-graph indication	Continuous /intermittent tone 	Detector Operative	**Detection of a metal mass**	Manage the metal mass according to the specified procedures.
 flashing	Low-Frequency Double Beep Double beep about every 4 seconds 	Detector ready	**Almost flat batteries.**	Keep on detecting. Prepare spare batteries.
 off	Low-Frequency Continuous Tone 	Detector Not Operative	**Flat Batteries.**	Replace the batteries.

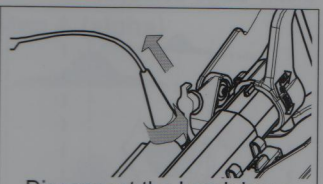
5.5. Shutting Down the Detector



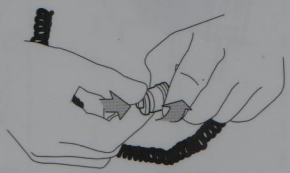
Set the ON/OFF switch to the OFF position.



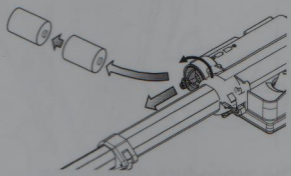
Remove any kind of dirt (dust, sand, moisture, ...) and clean the detector using a slightly moist, non-abrasive cloth.



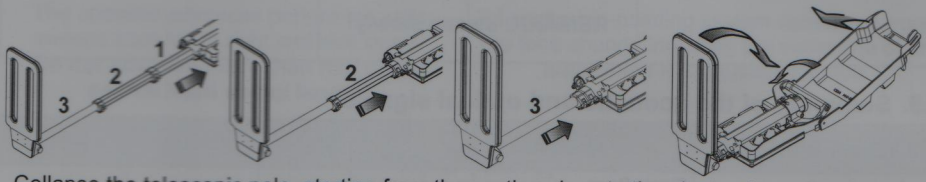
Disconnect the headphone cable.



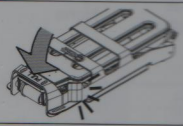
Reattach the protections to the connectors.



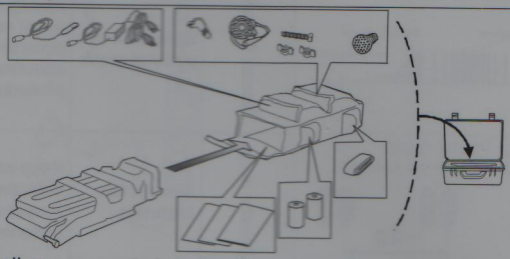
Remove the batteries from the battery compartment (for long periods only).



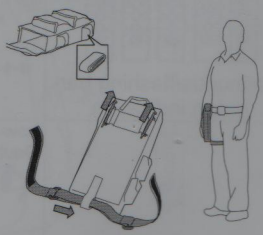
Collapse the telescopic pole, starting from the section close to the electronics unit, rotate the handle and close up the metal detector.



REMARK: when closing the arm support a slight click is heard: this snap position prevents the unit from opening accidentally.



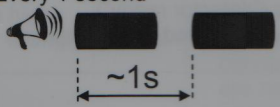
Pack all components into the Carry Bag (for a short pause in operations or transportation within operation area).
Pack all components into the Transport Case (option, for prolonged storage or transport world-wide).

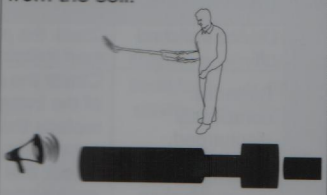


Using the leg strap.

6 - Troubleshooting and Maintenance

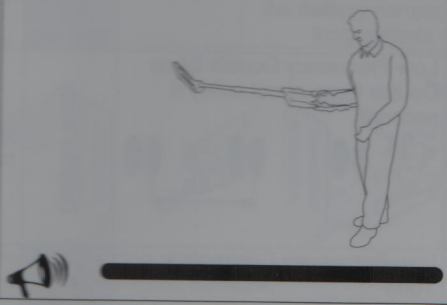
6.1. Acoustic and optical warning signals

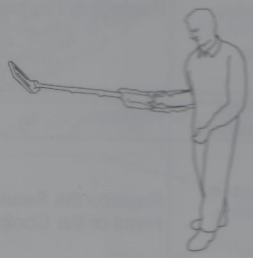
LED bar-indicator	Acoustic Signal	Status	Cause	Intervention
off	No audible signal	Detector Not Operative	Device switched off	Check the position of the main switch.
			Batteries completely discharged.	Check the charge level of the batteries and replace them if necessary.
			Batteries inserted wrong.	Check that the batteries are inserted correctly.
			Search head or headphone connection wrong or damaged.	Check that the headphone cable connector is inserted correctly.
				If the internal speaker in the Control Unit emits the audible signal when the headphone is connected, replace the headphone.
flashing	Low-Frequency Double Beep Double beep about every 4 seconds 	Detector ready	Almost flat batteries.	Keep on detecting. Prepare spare batteries.
off	Low-Frequency Continuous Tone 	Detector Not Operative	Flat Batteries.	Replace the batteries.
flashing	Low-Frequency Intermittent Tone A fault was detected by the Control Unit 	Detector Not Operative	Search Head cable damaged.	Replace.
			The system is not operating properly.	Replace the Search Head or the Control Unit.
flashing	High-Frequency Intermittent Tone Every 1 second 	Detector ready	Soil Compensation aborted. Presence of metals in the area chosen for the soil compensation procedure.	Repeat the Soil Compensation procedure in a soil without metals.

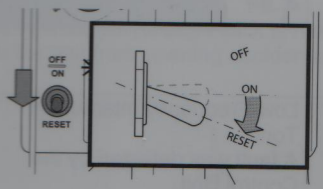
LED bar-indicator	Acoustic Signal	Status	Cause	Intervention
	**Continuous Tone or changing irregularly,** even keeping the search head far from the soil. 	Detector Not Operative	Electromagnetic interference.	Carry out the RESET procedure. If the noise remains unchanged: • verify that no other detectors are operating in the area (see section "Simultaneous use of several detectors") • verify that no electromagnetic interference sources are present in the area (radio transceivers, ...).

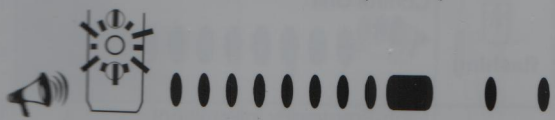
6.1.1. Reset function

WARNING!
If a continuous tone is heard after performing start-up and raising the Search Head, perform a reset.







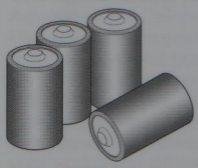


Activate the Reset Function by pushing the Main Switch down and holding for about 1 second. Operator will hear several rapid beeps then one beep approximately every 4 seconds ("detector ready").
The second LED lights up with each beep sounded by the speaker.

6.2. Periodic maintenance

- The unit itself does not require periodic maintenance, with the exception of the normal care (cleaning) of it at the end of operations.
- When using rechargeable batteries, it is necessary to maintain them periodically.

6.2.1. Periodic maintenance of the Ni-MH battery



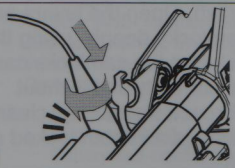
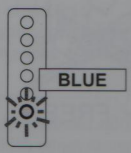
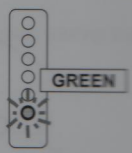
In case of a prolonged period of storage/unuse Ni-MH batteries lose naturally almost all their charge and then they might have difficulties in recharging.
In order to prevent that, we recommend that they undergo a complete charge cycle at least every 4 months even when unused.
Recharge the batteries every month to keep them always ready to use (charge at 80% or more).

CEIA will not be held responsible for any damage resulting from failure to observe the above mentioned instructions.

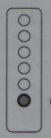
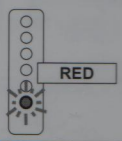
6.2.1.1. Use of the built-in battery charger

The metal detector includes a battery charger for NI-MH cells (see also the "Technical Features" section).

REMARK: the metal detector cannot be used during the recharging process.

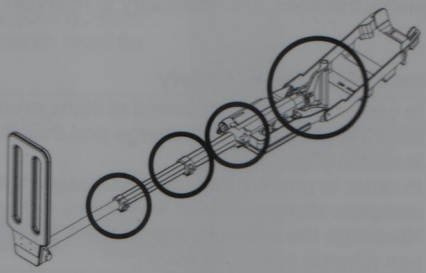
1	2	3
		
Connect the power supply adapter to the EARPHONE connector (it is also available a cable for 12/24Vdc power supply, fitted with a car cigarette lighter plug).	The charging process starts automatically (the bottom LED turns on BLUE).	When the battery is fully charged the LED turns on GREEN (approx. after 3 h). NOTE: there is no risk of overcharging the batteries.

Error signals

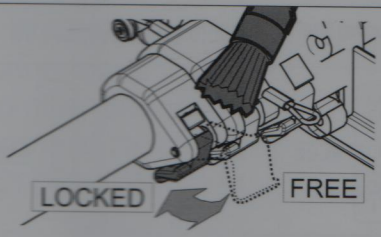
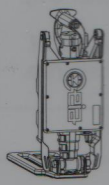
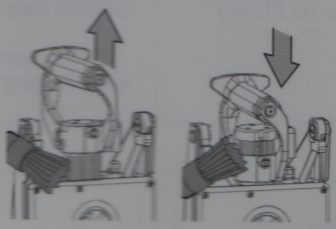
	
The LED is off: - wrong input voltage (too low or too high). - absent or wrongly inserted batteries.	The LED is RED: - disconnect the power supply cable from the EARPHONE connector. - reconnect the power supply cable to the EARPHONE connector: if the LED is RED again, one or both batteries are not working properly or are not compatible with the unit and must be replaced.

6.2.2. Cleaning Procedure

In case the unit is used in presence of dust, sand or other possible heavy environmental conditions, before packing it, a deep cleaning is recommended, to prevent the moving parts from possible damages.



Procedure

	**General cleaning.** Clean all parts of the unit deeply, using a brush.
	**Cleaning the camlocks.** Clean the telescopic pole deeply, using the brush. Open the levers and clean the camlocks deeply, using the brush. Check that the camlocks can be operated correctly and without excessive force. If necessary, clean the camlocks again in both locked and free position.
 	**Cleaning the handle.** Collapse the telescopic pole and close the arm support, so as the handle can be operated easily. Clean the handle sliding zone deeply in both collapsed and extended position, using the brush. Check that the handle can be collapsed/extended correctly and without excessive force. If necessary, clean again the sliding zone with the handle in both collapsed and extended position.
	**Final general cleaning.** Clean the detector using a slightly moist, non-abrasive cloth.

NOTE
Do not wash the device with liquid detergents or chemical substances!

7 - Appendices

7.1. Technical Features

Main features

- Detection of magnetic and non-magnetic metals.
- Very high sensitivity.
- Automated Soil Compensation.
- High precision pin-pointing of the target.
- Static and dynamic detection independent of the speed.
- Long battery operating time.
- Extremely compact, lightweight construction
- Lightweight detection head for maximum comfort during use.
- Synchronisation between adjacent detectors to eliminate reciprocal interference (down to 1m distance between units working on different channels).
- Extremely robust and reliable.
- Self-diagnosis system with audible signal in the case of malfunction or low battery charge.
- Built-in battery charger.

Technical data

- Very high detection distance, even for objects with a small content of metal.
- Adjustable sensitivity.
- Audio alarm with adjustable volume and optical alarm with LED bar-indicator.
- Built-in speaker and external headphone.
- Battery : 2 cells,
  - Type:
    - alkaline 1.5V or rechargeable Ni-MH 1.2V
    - size: ANSI standard size C or IEC standard size LR14
  - Acoustic warning message before complete battery discharge: about 1 hour of operation (during this time the detection capability and all the other performances of the unit are not affected).
  - Operational time (after reset, at 20°C /68°F)
    - Alkaline batteries: ≥ 6 hrs (Duracell® Procell C)
    - Rechargeable batteries: ≥ 8 hrs (rechargeable batteries 6000mAh size C)
      Battery self-discharging: residual charge of 65% when stored for 28 days at 20°C.
      Battery cycle life: > 500 cycles (IEC)
- Battery charger: battery type: 3000 to 6000 mAh NI-MH; input voltage 10...35Vdc; completely automatic charging process.

Protection degree (IEC 60529): IP 68 (water proof to 2 m).

- Storage temperature: -55 to +85°C (-67°F to 185°F).
- Operating temperature: -46 to +70°C (-51°F to 158°F).
- Complies with the international standards on radio interference and human exposure to electromagnetic fields.
- Dimensions :
  - Detection head: 140mm x 350mm (5.51" x 13.78"); Sensitive area: 140mm x 280mm (5.51" x 11.02")
  - Maximum length of the arm support-telescopic pole unit: 1290mm (50.79")
  - Telescopic pole length adjustment: 690mm (27.17").
  - Dimensions:
    - Closed metal detector: 387mm x 157mm x 76mm (15.24" x 6.18" x 2.99")
    - Metal detector in carry bag:
      - without accessories: 395mm x 200mm x 110mm (15.55" x 7.87" x 4.33")
      - complete of all accessories (hard transport case excluded): 395mm x 205mm x 130mm (15.55" x 8.07" x 5.12")
- Weights:
  - Metal detector, batteries included: 2100 g (4.67 lbs)
  - Carry bag in synthetic canvas: 540 g (1.19 lbs)
  - Monaural Headphone: 170 g (6.1 oz)

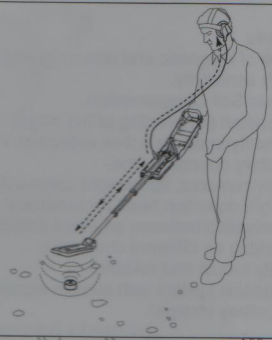
OPTIONS/ACCESSORIES

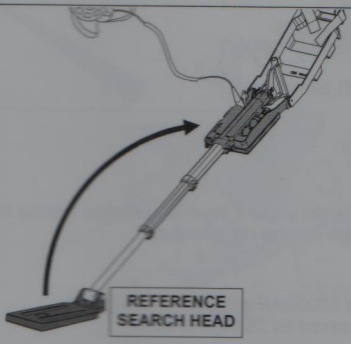
- 100-260V~ Power Supply Adapter for the built-in battery charger. Dimension and weight: 98mm x 42mm x 32mm (3.86" x 1.65" x 1.26"); 390g (0.86 lbs)
- DC Power Supply Cable for the built-in battery charger fitted with a car cigarette lighter plug.
- External loudspeaker.
- Hard Transport Case. Dimension and weight: 475mm x 350mm x 175m (18.7" x 13.78" x 6.89"); 4 kg (8.8 lbs).

7.2. Operating Principle

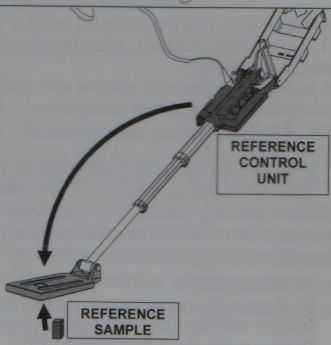
The electronics unit generates a suitable electromagnetic field through the search head.

The search head detects any change in the electromagnetic field due to the presence of a metal mass and sends this information to the electronics unit.
If the received signal is higher than a reference threshold (SENSITIVITY), an acoustic and optical alarm is given.



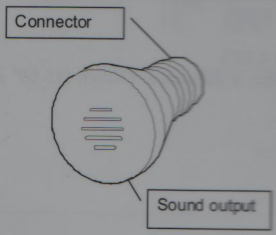


All Control Units are calibrated on a Reference Search Head during manufacturing.
The Control Unit Calibration Factors are stored in an EEPROM located on the control board.



All Search Heads are connected to a calibrated Control Unit and calibrated by means of Reference Samples during manufacturing.
The Antennae Calibration Factors are stored in an EEPROM located inside the Search Head.

7.3. External Loudspeaker



The external loudspeaker is a very high reliability, waterproof, external alarm loudspeaker. It has the same operation of the headphone normally supplied with the detector.

Specifications:
Main features
- Direct connection to the HEADPHONE control unit output.
- High acoustic intensity (85 dBA at 1m).

Technical Data
- Operative Temperature: -46° C to +70°C (-50.8°F to 158°F) .
- Storage Temperature: -55 to +85°C (-67°F to 179.6°F).
- Relative humidity: 0 to 95 % (without condensation).
- Weight: 27 g (1 oz).
- Overall dimensions: ø38mm x 35 mm (ø1.50 in x 1.38 in).

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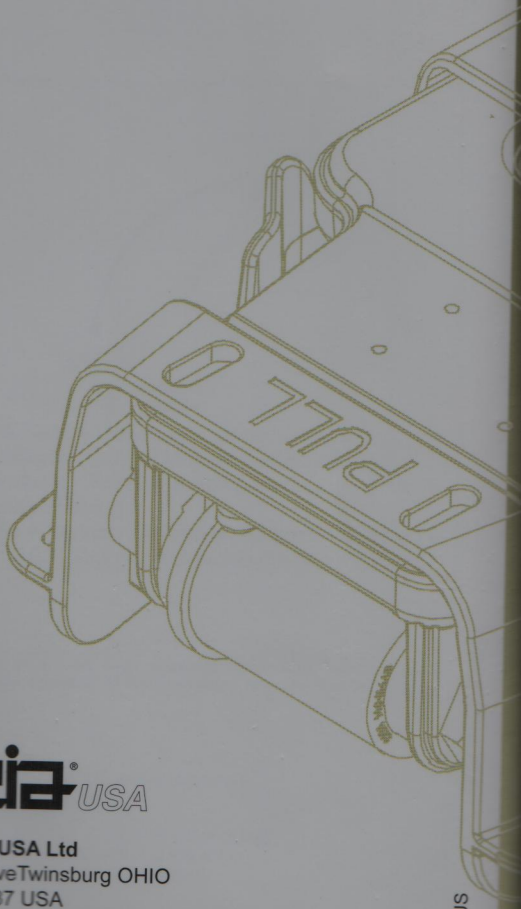

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